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at Pulkowa he was charged with the vertical circle to determine the declinations of the Pulkowa fundamental stars, and this led to his devoting attention to various questions of stellar astronomy. A man of his stamp could not be satisfied with merely making the observations, which he regarded as merely the starting-point for real astronomical work. He undertook a discussion of the theory of refraction, which forms the basis of the Pulkowa refraction tables. His memoir in the fifth volume of the Pulkowa observations gives a faithful picture of him as a practical astronomer. Finally, to give some idea of his versatility, we may mention the regions in which he did and published work of more or less importance : the theory of the motions of planets and comets, mathematical analysis, the problem of rotation, stellar parallax and proper motion, theory of refraction, variable stars, cosmogony, popular astronomy, biography, philosophy. The number of his published works and memoirs exceeds 200.

The astronomical world will mourn Gyldén's death, not only because a distinguished man of science of whom much might yet be expected has been cut off in the prime of life, but also because he has been snatched away from his most important researches on planetary motion just as he was about to gather the ripe fruits of his labours. This refers more especially to the second and third parts of his *Théorie des Orbites absolues*, and to the application of his methods to special cases of motions of the minor planets and satellites, for it was here that we might look for the most important results of his work in revising the theory of planetary motion. Although it is believed that he has left the work in MS. so nearly complete that it can be edited and published with comparatively little trouble, still it can no longer come from his own hands, and herein lies the bitter sadness of Gyldén's early death. On the other hand, it may be stated with confidence that the method of investigation in the planetary theory initiated by Gyldén has been established on a firm and permanent footing. For this no better testimony is needed than the number and names of those who have studied Gyldén's theory. That which he strove for he in the main accomplished, and the accomplishment required not only all his skill, but all his own great energy.

Gyldén possessed in the highest degree those qualities which make a scholar in the true sense of the word. His lofty conception of science and its aims was an inspiration to those who had the good fortune to be intimate with him ; personal intercourse with him was a perfect stimulus towards scientific activity.

[For the above notice the Council is indebted to Dr. O. Backlund, Director of the Pulkowa Observatory.]

CARL NICOLAUS ADALBERT KRUEGER was born on 1832 December 3 at Marienburg, in West Prussia. He was at school, first at Elbing, and later at Wittenberg. In 1851 he entered the Berlin University to study mathematics and science, and soon

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showed an especial preference for astronomy. But he did not devote himself exclusively to it until 1853, when he left Berlin for Bonn, and found in Argelander a master who understood better than all others how to inspire his pupils with a love of astronomy. Argelander soon remarked the ability and energy of his young pupil, who was not deterred by any amount of labour, and even before he took his Doctor's degree in 1854 August (for which his dissertation was "De ascensionibus rectis a Flamsteedio quadrantis muralis ope observatis"), appointed him, in the autumn of 1853, Second Assistant at the Bonn Observatory. He thus shared with Schönfeld the work on the recently undertaken Durchmusterung of the northern heavens, a task which called for all the energies of the workers if it was to be completed within a moderate time. It was finished in six years, and the results are published in vols. iii.–v. of the *Bonn Observations.* But Krueger showed himself a true pupil of Argelander, in that even this heavy work did not exhaust his activities. So far as it allowed, he observed comets and planets with the ring micrometer, variable stars, and computed numerous cometary and planetary orbits, especially that of the planet *Themis*, which he made his own particular care without intermission till his death. Two memoirs on the orbit of *Themis* appeared in 1866 and 1873 in the *Transactions of the Society of Finland.* A third memoir was projected, but unfortunately not completed. He also determined stellar parallaxes with the heliometer, especially those of 70 *Ophiuchi*, *Lalande* 21258, and *Arg. Oeltz.* 17415-6, and his triangulation of the cluster *h Persei* has been a pattern for other subsequent workers in the same field.

He was appointed First Assistant in 1859, and qualified as Privatdocent in the University in 1860. But in 1862 June he was called to Helsingfors as Professor of Astronomy and Director of the Observatory, which his honoured master, Argelander, had founded and directed until his appointment at Bonn. Here he selected for special attention the meridian circle, although observations of comets with the refractor were not neglected. His plan was to reobserve the stars of the Abo Catalogue, and to make special observations in conjunction with Argelander, but both projects were superseded by the zone observations for the *Astronomische Gesellschaft*, Krueger being one of the first to give in his adherence to the scheme. The 8-foot transit instrument seemed to him more suitable for the observation of his zone (+ 55° to + 65°) than the smaller circle, and he read the declinations on an auxiliary circle. The work was conducted with characteristic energy; the first zone was observed on 1869 August 30, and in 1876, when Krueger left Helsingfors, more than two-thirds of the whole was completed.

Besides observational work, Krueger found time at Helsingfors for considerable literary activity. First he reduced and published the Bonn heliometer observations, then he was continually busy with the orbit of *Themis*; and to this epoch (1868)

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belongs the computation of the orbit of Comet 1785 II, which was interesting as having elements somewhat resembling those of Comet 1867 III. His idea (1864) for the barometer compensation of a pendulum, by using an imperfect vacuum, was an important step in practical astronomy. His publication of the observations of the Helsingfors Magnetic and Meteorological Observatory from 1845–56, during which period the thermometer was read every twenty minutes, afforded an opportunity for a complete discussion of the mean temperature of Helsingfors, which appeared in 1874.

In 1876, on Hansen's death, Krueger was appointed Director of the Gotha Observatory. Had this promotion meant the interruption of the zone observations, he might have hesitated to accept it; but the Helsingfors University authorities generously lent the transit instrument to the Gotha Observatory for some years. Here he recommenced his work on 1877 July 31, after re-erecting the meridian piers. His completion of it was simultaneous with his leaving Gotha in 1880; and the few necessary revision observations were made by Donner at Helsingfors after the return of the instrument.

We come now to the last period of Krueger's life, during which he was Director of the Kiel Observatory and Editor of the *Astronomische Nachrichten*. It was not without many searchings of heart that he undertook these duties; but a mere glance at the forty volumes which appeared with his name on the title-page is sufficient to show that he was the right man in the right place. As soon as his editorial duties allowed him, he proceeded with the final discussion of his zone observations, which were published by the Helsingfors University in two volumes (1883 and 1885). Astronomers were thus able to judge of the quality of the work long before the appearance of the final Catalogue of 14,680 Stars, which was published by the *Astronomische Gesellschaft* in 1890.

In 1882 Krueger, as Editor of the *Astr. Nach.*, was appointed Director of the new "Centralstelle für Astr. Telegramme," and performed his new duties with the greatest zeal. He made it a point that the elements and ephemerides of the newly discovered comets should appear in the *Astr. Nach.* at the earliest possible moment, and computed not a few of them himself.

About the year 1889 an affection of the heart declared itself, and from the autumn of 1895 this and other complications made his illness assume a serious character, which was soon seen to be hopeless. He lingered some six months in great pain, and died on 1896 April 21.

Krueger was elected a Foreign Associate of this Society on 1879 January 10. Many other learned societies conferred similar honours upon him, especially the Finnische Societät, the Sächsische Ges. der Wiss., and the Berlin Akademie. He married a daughter of his master, Argelander, and had one daughter.

[His son-in-law, Dr. H. Kreutz, has kindly abridged this

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notice from his somewhat longer account in the *Vierteljahrsschrift der Ast. Gesell.*]

Didrik Magnus Axel Möller, the son of a civil officer in the province of Schonen, in South Sweden, was born 1830 February 16. He shewed mathematical ability of a high order almost from infancy, and entered the Lund University at an exceptionally early age. On passing his examination in 1853 he was immediately nominated Docent, in 1855 he was made an Observer, in 1861 Extraordinary Professor, and in 1863 Ordinary Professor. His predecessor in the chair was much occupied with public matters. Möller had practically undertaken the professorial work from the time he was appointed Docent, with the exception of a period in the years 1858–59, during which he travelled in mid-Europe with the object of adding to his scientific knowledge, a short time spent in visiting Pulkowa in 1861, and a few weeks in the summer of 1860, when he took part in the solar eclipse expedition to Spain.

In the years which followed Möller was on several commissions for the remodelling of the higher grade educational institutions of Sweden. His interest in all educational matters was very keen, and his opinion always commanded the greatest respect. For a long time he was Rector of his University, and would have held this office till his death but for his own wishes, which caused his resignation in 1895. Long after the conclusion of his duties as teacher he continued to superintend the final examinations of the students. His ability further shewed itself in various matters of administration, where his sound common sense and financial knowledge were of the greatest value. His fine constitution resisted the hardships and fatigues of a hard-working observer's life for many years; but in the spring of 1896, during a journey in North Sweden, he caught a severe cold. This left behind an affection of the heart which put a sudden end to his busy life on 1896 October 25.

Möller's scientific work began in 1853 with a determination of the longitude of Lund, after which he undertook the determination of the orbit of Comet 1852 III. Then the peculiarities of the orbit of Faye's Comet absorbed his attention; from 1860 onwards he undertook a long series of investigations on this subject, and by extraordinary care and completeness in his work he finally succeeded in determining the orbit with extreme precision, and gave ephemerides for the returns in 1865, 1873, and 1880–81 with a success which is well known. From the first this work attracted the notice of the astronomical world, and practical recognitions of its value came from various quarters. In his honour the Comet has been named Faye-Möller; and he was awarded the Gold Medal of this Society in 1881. In presenting the medal, the President, Mr. J. R. Hind, who was well qualified to speak with authority on the occasion, reminded the Society that the class of computation involved in such investigations is